



CASE REPORT

ENDOSCOPIC APPROACH FOR RESECTION OF A SMALL FRONTAL RECESS OSTEOMA CAUSING HEADACHE

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SUMMARY

Paranasal sinus osteomas are common, slow-growing, benign tumors that are usually asymptomatic. Most of these neoplasms are detected incidentally during routine radiological investigation of unrelated complaints. Symptoms and complications tend to develop when the mass expands; however, even a small osteoma in the frontal recess can interfere with aeration of the frontal sinus and lead to headache. A 34-year-old woman presented to our clinic with headache affecting the fronto-ethmoidal region. The Waters view and computerized paranasal sinus tomography showed an osteoma in the right frontal recess and a middle concha bullosa on the left side. There were no abnormalities on neurological and ophthalmologic examination. Other causes of headache were excluded and the frontal recess osteoma was treated endoscopically for the relieving of the chronic frontal headache.

Keywords: Frontal recess, sinus, nasal, paranasal, osteoma, endoscopic sinus surgery, headache, benign tumor

BAŞ AĞRISINA NEDEN OLAN KÜÇÜK BİR FRONTAL RESES OSTEOMUNUN ÇIKARILMASI İÇİN ENDOSKOPİK YAKLAŞIM

ÖZET

Paranasal sinüs osteomları sık görülen, yavaş büyüyen, genelde semptomsuz olan iyi huylu tümörlerdir. Bu tümörlerin çoğu ilişkisiz şikayetlerle rutin radyolojik incelemeler sırasında tespit edilirler. Kitle büyüdükçe belirti ve komplikasyonları gelişmeye başlamakla birlikte küçük bir frontal reses osteomu frontal sinüs havalanmasını engelleyebilir ve baş ağrısına neden olabilir. Kliniğimize fronto-etmoid bölge baş ağrısı şikayeti ile 34 yaşında bir bayan hasta başvurdu. Waters filmi ve paranasal sinüs tomografisi sağ frontal reses bölgesinde bir osteom ve sol konka bülloza gösterdi. Nörolojik ve göz muayenesinde herhangi bir anormallik yoktu. Diğer baş ağrısı nedenleri dışlandı ve kronik frontal baş ağrısının rahatlatılması için bu frontal reses osteomu endoskopik olarak tedavi edildi.

Anahtar Sözcükler: Frontal reses, sinüs, nazal, paranasal, osteom, endoskopik sinüs cerrahisi, baş ağrısı, iyi huylu tümör

INTRODUCTION

The osteomas are frequently seen benign tumors of paranasal sinuses.^{1,2} These tumors are usually asymptomatic and detected incidentally during the radiological investigation. They can be symptomatic depending on their location, size, rate of growth and expansion.³ The treatment for paranasal sinus osteoma is surgical excision; however, all osteomas do not require surgery. For many years, osteomas were treated with open surgical approaches like as the osteoplastic flap technique, lateral rhinotomy, and direct anterior surgical exposure of the frontal sinus. Nowadays, many forms of nasal and paranasal pathology including osteomas may be treated by endoscopic methods. The indications for surgery and the optimal approach are matters of controversy. In this article, we describe a patient who had a small osteoma in the frontal recess that was treated endoscopically.

CASE REPORT

In December 2001, a 34-year-old woman was seen at the Ear, Nose, and Throat Department of our center with the complaints of headache affecting the fronto-ethmoidal region, nasal obstruction, and postnasal discharge. She had had the headache problem for approximately 2-3 years. There were no abnormalities on neurological and ophthalmologic examination. Otorhinolaryngological examination revealed a nasal hump, septal deviation, and mucopurulent discharge. Plain radiography with a Waters view showed a small osteoma in the right fronto-ethmoidal region (Figure 1). The patient was treated with a 14-day course of oral antibiotics and systemic decongestant.

One month later, the postnasal discharge had decreased but the headache and nasal obstruction remained unchanged. Another Waters view x-ray was obtained and coronal paranasal computed tomography (CT) was performed. CT showed a dense, well-circumscribed mass measuring 9x8x6 mm in the right frontal recess, and a middle concha bullosa on the left side (Figures 2). The concha bullosa was not in contact with the nasal septum or the lateral nasal wall.

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Figure 1 : A Waters view radiograph showed a small osteoma in the right fronto-ethmoidal region



Figure 2 : Computed tomography scanning in the coronal plane demonstrated the osteoma in the right frontal recess.

The patient underwent endoscopic sinus surgery (ESS) to treat the concha bullosa and osteoma, and septorhinoplasty was performed to reconstruct the nasal-endonasal deformity. During ESS, the right middle concha was mobilized medially and the frontal recess was exposed via an uncinectomy. Both 0-degree and 30-degree endoscopes were used during the procedure. This allowed sufficient visualization of the surgical field and facilitated manipulation of the osteoma. The tumor was partially obstructing the frontal recess, and the mucosa around the mass appeared normal. Care was taken to avoid traumatizing the surrounding mucosa; thus, normal physiology was preserved and it was not necessary to obliterate the frontal sinus. The osteoma was mobilized and extracted using a Freer elevator. No drilling was necessary. There was

a small amount of hemorrhage, but this was easily controlled.



Figure 3: Computed tomography scanning in the coronal plane at 6 months post-surgery revealed a patent frontal recess, no residual tumor in the recess, and normal aeration of the frontal sinus.

The patient's pain disappeared completely in the first postoperative week. In light of this, we attributed her fronto-ethmoid headache to the osteoma. The findings on follow-up CT at 6 months are shown in Figure 3. At 12 months post-surgery, she remained free of symptoms. Nasal endoscopic examination at this stage revealed no evidence of inflammation or adhesions, and showed normal epithelialization of the right frontal recess.

DISCUSSION

Paranasal sinus osteomas are slow-growing, encapsulated, benign tumors that are most often found in the frontal and ethmoid sinuses, and less frequently in the maxillary and sphenoid sinuses.^{1,2} Most of these tumors are asymptomatic, and are detected during routine radiological investigation of unrelated complaints. Depending on location, size, and rate of growth, expansion of the mass may produce a variety of symptoms and complications.³ The tumor may cause cosmetic deformity directly, or may obstruct sinus ostia and lead to sinusitis or mucocele formation.^{4,5,6,7} If the neoplasm extends beyond the sinus boundary and begins to erode bone, vital anatomic structures such as the orbit and the cranium can be affected, producing a range of symptoms and problems. Orbital extension can displace the eyeball, impair extraocular muscle motility, and cause diplopia, proptosis, exophthalmus, optic nerve compression, papillary atrophy, and impaired vision.^{1,3,4,5,6,8,9} Intracranial extension from



the frontal, ethmoid, and sphenoid sinuses may lead to cerebrospinal fluid (CSF) leakage, intracranial infection, or abscess.^{6,7}

The frontal recess is an hourglass-shaped space that is defined by its surrounding structures, namely, the middle turbinate, uncinate process, lamina papyracea, ethmoid bulla, and agger nasi cells.¹⁰ Obstruction of this recess results in insufficient ventilation of the frontal sinus. When the drainage route for this cavity is blocked, the entrapped oxygen is absorbed by the mucosa and causes negative pressure within the sinus, which produces pain.¹¹ A small osteoma in the frontal recess can affect the patency of the frontal recess, decrease frontal sinus aeration, and produce negative pressure and headache.¹¹ Headache may also be the direct result of pressure from enlargement of the osteoma. Further, enlargement of small osteomas, especially those in specific locations such as the frontal recess and ethmoidal cells, may cause headache because these cavities cannot expand to any significant degree.

The management of frontal sinus and recess osteoma remains controversial. The only suspected pathology for headache must be the osteoma and all possible causes like as intracranial orbital and other paranasal pathologies must be excluded in the preoperative evaluation of the headache.

For decades, osteomas of these regions were treated with open surgical approaches. External approaches, including the osteoplastic flap technique, lateral rhinotomy, and direct anterior surgical exposure of the frontal sinus, have been used to access large osteomas of the fronto-ethmoidal region, with or without involvement of surrounding structures.^{9,12}

Today, endoscopic methods are used to treat many forms of nasal and paranasal pathology, including chronic or complicated sinusitis, dacryocystitis, orbital decompression, optic nerve decompression, cerebrospinal fistula, some tumors of the nasal and paranasal sinuses, and choanal atresia. Patient selection for ESS is important in cases of paranasal sinus osteoma. For example, not all fronto-ethmoid osteomas can be removed this way. Small frontal sinus osteomas that are located medial to the sagittal plane of the lamina papyracea and based in the postero-inferior wall of the sinus can be excised by ESS, as can most ethmoid sinus and frontal recess osteomas.⁶

In ESS, the following steps are used to expose the frontal recess^{16,17}:

- 1- The middle turbinate is mobilized medially.
- 2- The antero-superior aspect of the uncinate process is completely removed.
- 3- The antero-superior attachment of the bulla ethmoidalis can be removed to better visualize the recess.
- 4- If the anterior frontal and agger nasi cells are obstructing fronto-nasal outflow and blocking the surgeon's view of the frontal recess, these should be removed, taking care to preserve the mucosa of the frontal recess and ostium

At this stage, once adequate hemostasis has been achieved, the frontal recess should be in clear view. During manipulations in this area, the surgeon should always keep in mind that the anterior ethmoid artery traverses the skull base just posterior to the frontal recess.¹⁶

Leiberman and Tovi described the case of a patient with a frontal recess osteoma of similar size whose headache also resolved immediately after surgery.¹¹ However, these authors used the osteoplastic flap technique to remove the mass. Although the external approaches offer the advantage of good exposure, there are a number of potential disadvantages. These include risk of CSF leakage, stenosis of the frontal recess, mucocele formation, persistent anesthesia around the surgical wound, inadequate wound healing, formation of scar and keloid, and increased pigmentation over the wound area.^{1,8,13,14} In our case, we used EES for extraction of frontal recess osteoma for the relieving of the chronic frontal headache. We followed the above steps to access our patient's frontal recess. The endoscopic approach allowed us to visualize the pathology and surrounding area well during the procedure. ESS is a minimally invasive method that offers good cosmetic results, low morbidity, immediate patient mobilization, and early hospital discharge.¹⁵ Still, this method demands meticulous technique because serious complications can occur, even in simple procedures.

CONCLUSION

In appropriate osteoma cases, the endoscopic approach offers a high probability of recovery with low risk of morbidity. Any patient with a small osteoma who has chronic headache should be reviewed. If other causes are excluded, then the tumor can be removed by ESS. Careful use of nasoendoscopic technique can prevent CSF leakage and cosmetic deformity, which are relatively high risks with the osteoplastic flap technique. Also, when



endoscopic surgery is used for the removing small osteomas suspected to be causing headache, unnecessary follow-up of osteoma with frequent radiographs can be avoided.

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